CONTENTS

DISTRIBUTED SYSTEMS

An Architecture of a Map Stack for Real Time Applications 1
K. VIJAYANANDA, G. BERTHET, P. RAJA, J.D. DECOTIGNIE

Spatio-Temporal Constraints in Fieldbus: Requirements and Current Solutions 9
J.-D. DECOTIGNIE, P. RAJA

Transport Protocol for Real-Time Multimedia Communication 15
J.M. NG, N.T.C. YU

An Environment for Distributed Prototyping of Real Time Systems 21
A. ALONSO, J.C. DUEÑAS, G. LEÓN, J.A. DE LA PUENTE

Performance Prototyping for a Real Time System with Qualitative Parameter Tuning Methods 27
M. MIKI, Y. TAMURA, T. KAKUMU, T. HIRAI, K. ITOH

SCHEDULING

Least-Space-Time-First Scheduling Algorithm: A Policy for Complex Real-Time Tasks in Multiple Processor Systems 33
B.-C. CHENG, A.D. STOYENKO, T.J. MARLOWE

A Schedulability Algorithm for Data Flow, Hard-Real-Time Distributed Programs 39
R. DAVOLI, L.A. GIACHINI

Integrated Best Effort and Fixed Priority Scheduling 45
N.C. AUDSLEY, A. BURNS, R.I. DAVIS, A.J. WELLINGS

Some Scheduling Experiments with ARTIE 51
R.M. TOL, G. TE WINKEL

Multiple-Goal Objective Functions for Optimization of Task Assignment in Complex Computer Systems 55
T.J. MARLOWE, A.D. STOYENKO, P.A. LAPLANTE, R.S. DAITA, C.C. AMARO, C.M.NGUYEN, S.L. HOWELL

VERIFICATION AND VALIDATION

Two Proof Methods for the GRAFCET Language 61
P. LE PARC, B. QUEGUINEUR, L. MARCÉ

Specification and Analysis of Timing Properties in a Case Tool CONRAD 67
T. KALDMA, L. MOTUS, R. PALUOJA, J. TEKKO, T. TOMMINGAS

Hybrid Systems Modelling and Validating Using Statecharts and Grafcet 73
R. BOISSIER, B. DIMA, D. RAZAFINDRAMARY, T. SORIANO

Towards Recursive Block Diagrams 81
P. CASPI

Hierarchichal Correctness Verification in Multiphase Real-Time Software Design 87
T. SZMUC, P. SZWED, J.-J. SCHWARZ, J. SKUBICH

CONCEPTS AND ARCHITECTURES

Conceptual Design of an Architecture for Hard Real Time Computing 95
H.-P. MESKE

Synchronized UTC for Distributed Real-Time Systems 101
U. SCHMID

Data Acquisition for Real-Time Process Control Systems 109
M.D. VAN DER LAAN

Task-Configuration of a PEARL-Based Programmable Controller for Process-Automation 115
G. THIELE, H.-J. BEESTERMÖLLER, L. RENNER, M. DORNO, D. POPOVIC

A Note on Hardware-Software Codesign 121
T. TEMPELMEIER

OPERATING SYSTEMS

MMOSS: Soft Real-Time Operating System Support in a Multimedia Communication Subsystem 127
C. FAN

BED: A Multithreaded Kernel for Embedded Systems 133
P. BURGESS, M.J. LIVESEY, C. ALLISON

On Realtime Operating Systems: How to Compare Performance? 139
M. MAECHTEL, H. RZEHAK

An Architecture Supporting Real-Time Programming and Implementations 145
S. MOSTERT

SOFTWARE DEVELOPMENT

Mapping PEARL's High-Level Real-Time Constructs to a C Run-Time Library under Real-Time Unix 151
R. BELSCHNER, C.E. PEREIRA

Visual Methods in Real-Time Programming 157
M.G. HINCHEY

A Distributed Task-Oriented Real-Time Programming System 163
G. SCHROTT

Concept for a Real-Time Structured Database Query Language (RT-SQL) 167
P.J. FORTIER, J. PRICHARD

Requirements for a Real-Time Image Processing Language 175
P. LAPLANTE, T. MARLOWE, A. STOYENKO

Combined Sequential and Function-Oriented Programming for Real-Time Systems 181
H. SCHWEINZER, C. MITTERMAYER

Author Index 187

Keyword Index 189

Workshop Participants 191